



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,389	03/18/2005	Kazutomo Hoshino	8097-1004	7028
466	7590	01/28/2008	EXAMINER	
YOUNG & THOMPSON			BERNARD, VIJI	
745 SOUTH 23RD STREET				
2ND FLOOR			ART UNIT	PAPER NUMBER
ARLINGTON, VA 22202			1792	
			MAIL DATE	DELIVERY MODE
			01/28/2008	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/528,389	<b>Applicant(s)</b> HOSHINO ET AL.	
	<b>Examiner</b> Viji N. Bernard	<b>Art Unit</b> 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 31 May 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 7-17 and 20-22 is/are allowed.
- 6) ☒ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>03/18/2005</u> | 6) <input type="checkbox"/> Other: _____  |

***DETAILED ACTION***

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-6, 18, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent No: 2002-128583 to Noriyuki.**

***Regarding Claims 1, 2, 4, 5,*** Noriyuki et al teach a jig for calcining an electronic component comprising a substrate and a zirconia surface layer formed on the substrate and having an arithmetic average roughness "Ra" from 5 to 40  $\mu\text{m}$  (Page 2, Paragraph 0005) , or a ten-point average roughness "Rz" from 30 to 130  $\mu\text{m}$ , or a maximum height "Ry" from 40 to 200  $\mu\text{m}$  characterized in that a skewness (deflection) "Rsk" of the zirconia surface layer is from -0.5 to 0.5 or 2 to 3 and "A jig for calcining an electronic component comprising a substrate, an intermediate layer formed on the substrate and a zirconia surface layer formed on the intermediate layer (alumina) and having an arithmetic average roughness "Ra" from 5 to 40  $\mu\text{m}$  (Page 2, Paragraph 0008, Page 2, Paragraph 0016) , or a ten-point average roughness "Rz" from 30 to 130  $\mu\text{m}$ , or a maximum height "Ry" from 40 to 200  $\mu\text{m}$ , characterized in that a skewness (deflection) "Rsk" of the zirconia surface layer is from -0.5 to 0.5 or 2 to 3.

**Regarding Claims 3, 6, 18, 19**, Noriyuki et al the zirconia surface layer includes from 50 to 75 % in weight of coarse particle aggregate having from 80 to 300 mesh and 50 to 25 % in weight of fine particle bond phase having an average particle size from 0.1 to 10  $\mu\text{m}$  (Page 2, 4, Paragraph 0005, 0015).

**Claims 1, 2, 4, 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent No: 2002-060277 to Toshiya.**

**Regarding Claims 1, 2, 4, 5**, Toshiya teach a jig for calcining an electronic component comprising a substrate and a zirconia surface layer formed on the substrate and having an arithmetic average roughness "Ra" from 5 to 40  $\mu\text{m}$  (Abstract, Page 2,3,4, Paragraph 0006, 0011, 0014) , or a ten-point average roughness "Rz" from 30 to 130  $\mu\text{m}$ , or a maximum height "Ry" from 40 to 200  $\mu\text{m}$  characterized in that a skewness (deflection) "Rsk" of the zirconia surface layer is from -0.5 to 0.5 and "A jig for calcining an electronic component comprising a substrate, an intermediate layer formed on the substrate and a zirconia surface layer formed on the intermediate layer (alumina) and having an arithmetic average roughness "Ra" from 5 to 40  $\mu\text{m}$  (Page 4, Paragraph 0015) , or a ten-point average roughness "Rz" from 30 to 130  $\mu\text{m}$ , or a maximum height "Ry" from 40 to 200  $\mu\text{m}$ , characterized in that a skewness (deflection) "Rsk" of the zirconia surface layer is from -0.5 to 0.5.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims 7-9, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent No: 2002-128583 to Noriyuki in view of U.S. Patent No: 6,312,785 B1 to Sato.**

*Regarding Claims 7, 8*, Noriyuki et al teach that the apparatus of the invention substantially as claimed and also teach that the center line average exceeds 40 micrometers, the zirconia surface layer which it becomes easy to be generated with a rug (Page 4, Paragraph 0013) and these are process effective variables and these values are optimizable.

But Noriyaki fail to teach a central surface average roughness "Sa" of the zirconia surface layer is from I0 to 40  $\mu\text{m}$ .

However, Sato teach a magnetic recording medium having central surface average roughness for the purpose of improving magnetic characteristics, excellent durability, weather resistance, low error rates and satisfactory friction (Col.14, Line 19-24) and central surface average roughness "Sa" is from I0 to 40  $\mu\text{m}$  is optiimizable.

Thus, it would have been obvious to one of ordinary skill in the art at the time applicant's claimed invention was made to have provided a central surface average roughness "Sa" of the zirconia surface layer is from I0 to 40  $\mu\text{m}$  in Noriyuki et al in order to improve excellent durability, wear resistance as taught by Sato.

**Regarding Claims 9, 20**, Noriyuki et al the zirconia surface layer includes from 50 to 75 % in weight of coarse particle aggregate having from 80 to 300 mesh and 50 to 25 % in weight of fine particle bond phase having an average particle size from 0.1 to 10  $\mu\text{m}$  (Page 2, 4, Paragraph 0005, 0015).

**Claims 10, 11, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent No: 2002-128583 to Noriyuki in view of U.S. Patent No: 5, 338, 577 to Burdette, II.**

**Regarding Claims 10, 11, 13, 14**, Noriyuki et al teach that the apparatus of the invention substantially as claimed.

But Noriyaki fail to teach a jig for calcining an electronic component comprising a substrate and a zirconia urface layer formed on the substrate, characterized in that a wear resistance in a reciprocating wear test conducted in accordance with JIS-H8503 is from 10 to 200 (DS/mg) and a jig for calcining an electronic component comprising a substrate, an intermediate layer formed on the substrate and a zirconia surface layer formed on the intermediate layer, characterized in that a wear resistance in a reciprocating wear test conducted in accordance with JIS-H8503 is from 10 to 200 (DS/mg) and a jig for calcining an electronic component comprising a substrate and a zirconia surface layer formed on the substrate, characterized in that a thermal shock resistance  $\Delta T$  ( $=T_1 - T_2$ ) is 400°C or more expressed as a temperature difference of rapid cooling which generates strength reduction in a rapid cooling bending test where the jog for calcining the electronic component is rapidly cooled from specified temperature  $T_1$  to  $T_2$  and A jig for calcining an electronic component comprising a substrate, an intermediate layer formed

on the substrate and a zirconia layer formed on the intermediate layer, characterized in that a thermal shock resistance  $\Delta T$  is 400°C or more.

However, Burdette, II teach a zirconia surface layer formed on the intermediate layer, characterized in that a wear resistance in a reciprocating wear test conducted in accordance with JIS-H8503 is from 10 to 200 (DS/mg) (Col. 5, Line 18-35 teach that ceramic coatings (Zirconia) have high thermal shock resistance and wear resistance) and a zirconia surface layer formed on the substrate, characterized in that a thermal shock resistance  $\Delta T$  ( $=T_1-T_2$ ) is 400°C or more (Col. 4, Line 15-24) for the purpose of protecting the metal component from the negative effects of abrasion, temperature and oxidation (Col. 1, Line 11-14) and wear resistance with JIS-H8503 is from 10 to 200 (DS/mg) and thermal shock resistance  $\Delta T$  ( $=T_1-T_2$ ) is 400°C or more are optimizable.

Thus, it would have been obvious to one of ordinary skill in the art at the time applicant's claimed invention was made to have provided a zirconia surface layer formed on the intermediate layer, characterized in that a wear resistance in a reciprocating wear test conducted in accordance with JIS-H8503 is from 10 to 200 (DS/mg) and a zirconia surface layer formed on the substrate, characterized in that a thermal shock resistance  $\Delta T$  ( $=T_1-T_2$ ) is 400°C or more in Noriyuki et al in order to protect the metal component from the negative effects of abrasion, temperature and oxidation as taught by Burdette, II.

***Regarding Claims 12, 15, 16,*** Noriyuki et al the zirconia surface layer includes from 50 to 75 % in weight of coarse particle aggregate having from 80 to 300 mesh and 50 to 25 % in weight of fine particle bond phase having an average particle size from 0.1 to 10  $\mu\text{m}$  bonded

with each other by a sintering aid made of two or more metal oxides for increasing the wear resistance (Page 2, 4, Paragraph 0005, 0015).


*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Viji N. Bernard whose telephone number is 571-272-6425. The examiner can normally be reached on Mon-Fri 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Viji Bernard  
Examiner  
Art Unit 1792

  
Ram Kackar  
Primary Examiner  
Art Unit 1792